

proper tests: there are also miasmata, or matters which arise in perspiration, &c. which, when they are decomposed by heat or otherwise, at all events give ammonia and sulphurous productions, and which, therefore, must exist in some form of sulphuretted vapour in their transit or in their ordinary state: we know not always, perhaps, what the actual condition of the organic miasma which arises is. The sulphurous acid which is directly in the atmosphere proceeds, to a very large extent, from the coal burnt in London."

He further says, "There is a substance which we call ammonia, which gains access into the London atmosphere in many ways, arising considerably from some manufactures, which would help very much either the sulphurous vapour or the miasma from the body, to injure the pictures, being one of those things which would increase the chemical action of the impure air upon them."

"I think," says the witness, "that to the extent to which you can remove them from the condition of the atmosphere at Charing-cross into a purer condition of atmosphere, so far you will save the pictures, and as far as you can, if that be an object, diminish the number of persons who enter the Gallery and look at the pictures: so far that will also tend to save the pictures."

Here arises the question whether it is better they should do their work with the masses and perish, or should be carefully preserved,—out of reach. A question which further suggests that there are two classes of pictures, and that it might be expedient to deal with them differently.

Continuing our reference to the opinions that have been given,—Mr. W. Coningham would be sorry to see the pictures removed from their present position, and considers that the present site is the finest in the world for the erection of a gallery.

Mr. Farrer thinks that the present is the worst situation which could be chosen, viewing the preservation of the pictures; but with regard to public convenience, that there could not be a better. "The whole of the smoke that comes from the Thames when the easterly winds prevail, is carried into the Gallery, and so extensively does that operate, that the statue which is erected to the late Sir David Wilkie is covered with soot, and so black that it seems quite ridiculous: the nose is as black as if soot had been rubbed upon it, instead of falling by accident. Another circumstance I may mention, which is, that I went into the room from which the pictures had been taken and removed to Marlborough House: I found at the back of the pictures a large quantity of dust: it is not the common dust from the road, which is easily got rid of, but it is positive soot, about a quarter of an inch in height, hanging at the back on those walls. Even the front of the building itself is covered with black: it is visible to any person."

The prevailing wind being from the west, the building should be placed farther west, to escape the smoke now blown into it.

Mr. Mulready is of opinion that the pictures are suffering greatly from being in the midst of smoke and bad atmosphere, and accessible to a larger number of persons at one time than are likely to be instructed by them.

Mr. Hurlstone, the president of the Society of British Artists, denies strenuously that any injurious effects result from the atmosphere

of Trafalgar-square, and maintains that the central situation of a National Gallery is of vital importance, as without this condition it does not fulfil the object for which it was established.

We shall hear what is said on Monday.

#### CARBONIC ACID GAS IN VENTILATION.

It is as easy for some gifted souls as sliding down a declivity, to assume an antagonist's ignorance, and then to dash off into an elegant disquisition by way of clearing up the inky obscurity; but in these days of temporal calculation and economy, it is a pity to dilute good matter and to waste precious time by illuminating the ordinary daylight of the nineteenth century even with an electric flash, or to do what is destined incontinently to be undone. In the useless attempt to operate with a glittering array of saws and cutting instruments upon the sound extremities of a subject which, in its vitals, may or may not (as yet remains to be seen) be hopelessly unsound, your correspondent "E. L. G." will find, I fear, that he has only mangled the members of his own subject. I do not think that he is right in fearing that he "rides his hobby" too far or too fast, but I do think that, in showing out its paces, he might have been content to ride it without overriding and upsetting the plain sense and meaning of the few brief and condensed remarks in which my hint or suggestion was conveyed, and so going rather too far ahead, even in his own course, besides riding backwards right over it, as I shall show you he does. Nevertheless, although much of the matter contained in "E. L. G.'s" article is based on an erroneous and somewhat hypercritical interpretation of my well-meant suggestion, and displays an anxiety to throw light upon what was not dark, still I think that the readers of THE BUILDER are indebted to me for calling forth much of what, over and above all this, remains of useful remark and information.

Where did "E. L. G." discover that I either "misalled" "foul air" "pure 'carbonic acid,'" or believed it to be so? "E. L. G." himself admits that it is the carbonic acid contained in foul air which "renders it poisonous." Foul air, then, so far as it is positively "poisonous"—so far, in short, as it mainly concerns us in ventilation, or whatever "E. L. G." may choose to call the present subject of discussion, is, essentially, "carbonic acid," however much diluted, though not, as "E. L. G." has it, "pure 'carbonic acid.'" When even chemists prepare a poisonous acid such as the hydrocyanic, or prussic acid, which, by the way, also contains carbon, they call it still prussic acid, however much diluted, or of whatever "strength" it may be, and no one but a hypercritic would ever object to this as either *misalled* the compound or speaking loosely of it. Even in doing so, however, one would at least expect that all the looseness and all the *misalling* was on the side of the alleged misnomer, and that his learned critic would at least take care that he did not "live in a glass house" while he was "throwing stones." In the present instance, however, the assailant has overlooked this necessity, while bent on aiming at his antagonist through his own unseen but transparent silicate. In doing so he is loosely, no less than erroneously, states that I have *misalled* "respired breath" carbonic acid. It is clear enough that he means what every one else, as he will find, more correctly calls "expired breath," but he is rather "loose" here in his own meaning, while in one and the same "breath" criticising, erroneously and unfairly, an alleged loose expression of mine. Respiration is a twofold operation, consisting of the two distinctive acts of inspiration and expiration. Carbonic acid, or foul air, is expired but not inspired, and hence, properly speaking, not respired, unless, indeed, "E. L. G." adopts the idea for which he ridicules Dr. Arnott, namely, that "dilution of foul air with fresh" is a proper *pabulum vite* in respiration, or rather that a draught of foul air "without" is fit and proper for this purpose.

Moreover, in enlightening "D.'s" ignorance as to the true constituents of foul air, "E. L. G." speaks of the portion of unaltered oxygen it contains, and also, if I mistake not, of the air-proper, or nitrogen; but he omits the aqueous vapour which, in greater or less degree, is also a constant ingredient of foul air. But it was needless to do so in the circumstances, he will doubtless think; and so it was,—precisely as it was unnecessary for me to be hypercritically exact on the same subject, and in the same circumstances. There is one mistake of "E. L. G.'s," however, not yet alluded to, which it is by no means unnecessary here to point out, inasmuch as it is one of some importance, and may lead him farther into error unless corrected. He will find, on a little farther research, that it is not the case that "fires and lights" yield "almost undiluted carbonic acid;" otherwise we should hear less of "smoke consumption." When means are taken to "consume the smoke" of fires, or even of lights, but especially of fires, they do yield "almost undiluted carbonic acid," but this is a most material qualification of "E. L. G.'s" unqualified assertion. On the whole, too, after all, it is somewhat amusing to find "E. L. G." allowing himself the privilege of regarding "foul air" as carbonic acid, while at the very same moment denying that privilege to "D." When he says that "No mechanical power—and no available chemical one but the green forests—can separate fresh and foul air once allowed to mix," what does he infer but that this "foul air," to be so "separated" by "the green forests," is carbonic acid, which is essentially what the green forests do so "separate." From the pen of one who has handled carbonic acid in the solid state, as I have done, and poured it in the gaseous state, like water, out of one vessel into another, even while still warm from combustion, and who never for an instant overlooks it as the positive and palpable poison, beyond all else, to be dreaded and be guarded against in foul air from the human lungs, perhaps the use of the term *may* come sometimes, for brevity's sake, a little too freely to be palatable to fastidious critics such as "E. L. G.;" but in the present instance he will find, upon referring to what I really did say, that although I spoke of "the management of carbonic acid gas as generated from human lungs," he is wrong in stating that I *misalled* "foul air," even "carbonic acid," far less "pure 'carbonic acid,'" as he distinctly asserts.

Can it be possible, from his minute details as to the comparatively small quantity of carbonic acid diluted by the remanent oxygen, vapour, &c. in foul air, and—in his evident anxiety to make it "small" by degrees and beautifully less—even the still smaller quantity of simple carbon—invent carbon, should I call it—in carbonic acid itself,—can it be possible, I say, that "E. L. G." is fully aware that "the continued respiration, for several hours, of air containing not more than one or two per cent. of carbonic acid has been found to produce alarming effects?" This being the case, what purpose can be served by enlarging in such a line of remark, unless it be to pooh pooh the subject of ventilation altogether; for such is the ostensible conclusion to which those who do ignorantly underrate its importance will but too readily jump, from elaborate and anxious deprecations and details so really and essentially irrelevant, as to either the absolute or the relatively small quantities of carbon in carbonic acid, or of carbonic acid in the expired breath of a human being; and as to the necessity or non-necessity of "downward drainage," with which it is mixed up.

\* Even here "E. L. G." may not be so positively correct as he imagines, if Dr. Graham be right in saying that "In an intimate mixture of two gases the most diffusive gas separates from the other, and leaves the heavier in the greatest proportion. Hence a sort of mechanical separation of gases may be effected." It is well known, too, that by capillary attraction, gases, especially inflammable gases, of which carbonic acid is one, will pass through a sheet or bag of caoutchouc, and on the above law might thus be separated from common air. Moreover, there are available chemical powers, by which foul air may be separated from fresh; e.g. the power of hydrate of lime, which is actually recommended by Lortie for use in close places, as "E. L. G." might have seen in THE BUILDER itself, for 12th July, 1851; and also he other chemists, even as a respirator over the mouth, of an inch in thickness.